

WHAT IS CLAIMED IS:

1 1. An implantable prosthesis, comprising:
2 a body structure having an outer surface capable of contacting a surface of
3 a vascular lumen;
4 a plurality of grooves defined on said outer surface of said body structure;
5 and
6 filament portions containing a therapeutic substance disposed in said
7 plurality of grooves.

1 2. The implantable prosthesis of Claim 1, wherein each of said
2 plurality of grooves has a preselected and controlled distribution and a preselected
3 and controlled depth.

1 3. The implantable prosthesis of Claim 2, wherein said preselected and
2 controlled depth is equal to about 10% to 90% of a thickness of said body
3 structure.

1 4. The implantable prosthesis of Claim 2, wherein said preselected and
2 controlled depth is not greater than about 65% of a thickness of said body
3 structure.

1 5. The implantable prosthesis of Claim 1, wherein each of said
2 plurality of grooves are open ended.

1 6. The implantable prosthesis of Claim 1, wherein said plurality of
2 grooves are formed by exposing said outer surface to an energy discharge from a
3 laser.

1 7. The implantable prosthesis of Claim 1, wherein each of said
2 plurality of grooves are formed in rows extending approximately perpendicular to a
3 central longitudinal axis of said body structure.

1 8. The implantable prosthesis of Claim 1, wherein each of said
2 filament portions comprise a polymer material.

1 9. The implantable prosthesis of Claim 1, wherein said therapeutic
2 substance comprises a substance selected from the group consisting of
3 antineoplastic, antiplatelet, anticoagulant, fibrinolytics, antimetabolic, thrombin
4 inhibitor, antiinflammatory, and antiproliferative agents.

1 10. The implantable prosthesis of Claim 1, wherein said therapeutic
2 substance comprises a radioactive isotope.

1 11. The implantable prosthesis of Claim 1, further comprising a barrier
2 formed on said outer surface of said body structure, wherein said barrier covers

3 each of said plurality of grooves to reduce the rate at which said therapeutic
4 substance is released.

1 12. An implantable prosthesis, comprising:
2 a body structure having an outer surface capable of contacting a surface of
3 a vascular lumen;
4 a plurality of grooves defined on said outer surface; and
5 a polymeric substance containing a therapeutic substance disposed in said
6 plurality of grooves.

1 13. A method of loading a substance into a body of an implantable
2 prosthesis, comprising:
3 providing a body structure having an outer surface capable of contacting a
4 vascular lumen surface;
5 forming grooves on said outer surface of said body structure; and
6 positioning a monofilament including a therapeutic substance in said
7 grooves.

1 14. The method according to Claim 13, wherein said positioning
2 comprises winding a monofilament around said body structure to rest in said
3 grooves.

1 15. The method according to Claim 14, further comprising removing
2 portions of said monofilament extending outside of said grooves.

1 16. The method according to Claim 13, further comprising forming a
2 barrier on said lumen contacting surface of said body structure for releasing said
3 therapeutic substance at a controlled rate.

1 17. The method according to Claim 13, wherein said grooves comprise
2 open ended trenches extending substantially perpendicular to a central axis of said
3 body structure.

1 18. The method according to Claim 13, wherein said therapeutic
2 substance comprises a substance selected from the group consisting of
3 antineoplastic, antiplatelet, anticoagulant, fibrinolytics, antimetabolic, thrombin
4 inhibitor, anti-inflammatory, and antiproliferative substances.

1 19. The method according to Claim 13, wherein said monofilament
2 comprises a polymer material including polyurethane blended with 10%-30%
3 dexamethasone.

1 20. An implantable prosthesis, comprising:
2 a body structure having an outer surface capable of contacting a surface of
3 a vascular lumen;
4 a plurality of open-ended trenches defined on said outer surface; and

- 5 a portion of a microfilament containing a therapeutic substance disposed in
- 6 said plurality of trenches.